

★ YOSI P23 93-110928/14 ★ EP 535608-A1  
Belt buckle for clothing, suspender, bag or sports equipment etc. -  
has upper and lower plates connected together with plug body having  
resilient tongue-shaped operating plate (Eng)  
YOSHIDA KOGYO KK 91.09.30 91JP-278719  
(93.04.07) A44B 11/25

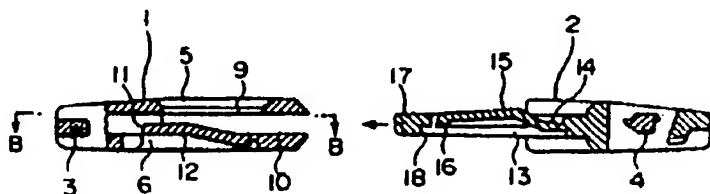
92.09.29 92EP-116673 R(DE FR GB IT)

The socket body (1) includes upper and lower plates (5, 6) connected with one another at one ends. The upper plate (5) has a central circular through-hole (9). The lower plate (6) has an annular edge portion (10) and a tongue-shape locking projection (12) which extends from the annular edge portion (10) at a side remote of the base end portion of the socket body (1) and which terminates in an engaging edge (11).

The plug body (2) includes an insertion member (13) having a resilient tongue-shape operating plate (15) which extends from the base end portion and terminates in an annular marginal portion (17) having on its under side an engaging ledge (18).

ADVANTAGE - The coupling of the socket and plug bodies is prevented from being accidentally released, and so thick buckle is suitable for use in any fastener. (9pp Dwg.No.2/5)

CT: EP309943 FR2501484 US3251110 US4035877  
N93-084476



© 1993 DERWENT PUBLICATIONS LTD.

Derwent House, 14 Great Queen Street, London WC2B 5DF England, UK

US Office: Derwent Inc., 1313 Dolley Madison Blvd., Suite 401, McLean VA 22101, USA

Unauthorised copying of this abstract not permitted



**DERWENT**

Scientific and Patent Information

BEST AVAILABLE COPY

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) Publication number:

**0 535 606 B1**

(12)

## EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: 20.12.95 (51) Int. Cl.<sup>8</sup>: **A44B 11/25**

(21) Application number: **92116673.2**

(22) Date of filing: **29.09.92**

(54) **Buckle**

(30) Priority: 30.09.91 JP 278719/91

(43) Date of publication of application:  
07.04.93 Bulletin 93/14

(45) Publication of the grant of the patent:  
20.12.95 Bulletin 95/51

(84) Designated Contracting States:  
**DE FR GB IT**

(56) References cited:  
EP-A- 0 309 943  
FR-A- 2 501 484  
US-A- 3 251 110  
US-A- 4 035 877

(73) Proprietor: **YKK CORPORATION**  
**No. 1, Kanda Izumi-cho**  
**Chiyoda-ku,**  
**Tokyo (JP)**

(72) Inventor: **Fudaki, Tsutomu**  
**87, Kitano**  
**Kurobe-shi,**  
**Toyama-ken (JP)**

(74) Representative: **Casalonga, Axel et al .**  
**BUREAU D.A. CASALONGA - JOSSE**  
**Morassstrasse 8**  
**D-80469 München (DE)**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid (Art. 99(1) European patent convention).

## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention:

This invention relates to a fastener composed of male and female members to be coupled together by insertion, in which the male member can be inserted into the female member longitudinally within a generally fan-shape range and can be angularly moved within a predetermined range after the insertion, and to more particularly to a belt buckle to be used for a clothing, a suspender, a bag, a sports equipment, etc.

#### 2. Description of the Related Art:

This type of buckle is currently known (Japanese Design Registration No. 794905) which comprises a socket body having a hollow and a locking hole formed in a front surface of the socket body and communicating with the hollow, and a hook-shape plug body to be inserted into the hollow and having a locking portion to be resiliently received in the locking hole and to be locked with a forward end of the locking hole and in which the plug body can be moved freely within a predetermined angle with respect to the socket body.

With the known buckle described in the previous paragraph, partly since the buckle is made of plastics, and partly since the socket body has upper and lower plates defining therebetween a hollow into which the plug body is to be inserted and has in each of opposite side walls an opening communicating with the hollow portion, the plug body can be angularly moved freely within a predetermined range when it is inserted into the socket body for coupling therewith.

However, when it is in use, this conventional type buckle not necessarily would bear only a plane load; that is, a twisting or wrenching force would act on the plug body. Since the forward end of the socket body is apt to be deformed as it is coupled with the plug body at the forward side, the upper and lower plates would be forced apart from each other so that the plug body will easily be released from the socket body.

Assuming that the plug body is twisted so as to thrust the upper plate of the socket body upwardly when the socket and plug bodies cross each other at an angle, e.g. about 120°, the plug body will be removed from the socket body with maximum ease.

US-A-4,035,877 discloses a buckle having the following features: a socket body made of a resilient material and having a base end portion to which one end of a belt is to be attached; and a

plug body made of a resilient material and having a base end portion to which an opposed end of the belt is to be attached; wherein the socket body includes upper and lower plates connected with one another at one end, the upper plate having an opening, the lower plate having an annular edge portion and a tongue-shape locking projection which extends from said annular edge portion at a side remote of said base end portion of said socket body and which terminates in an engaging edge, and that said plug body includes an insertion member having a resilient tongue-shape operating plate which extends from said base end portion and terminates in an annular marginal portion having on its under side an engaging ledge to be locked with said engaging edge when said plug body is inserted into said socket body, the edge portion of the lower plate is annular, and the engaging edge of the socket body is defined by a forward essentially flat, semicircular part of the locking projection which is slightly bent upwardly.

### SUMMARY OF THE INVENTION

It is therefore an object of this invention to provide a buckle in which the coupling of a plug body with a socket body is not accidentally released even in the presence of any kind of load acting on the buckle in use and in which the plug and socket bodies are locked at a base end side deep in the socket body, so that the socket body is hardly deformed and hence the plug body is hardly removed from the socket body, thus making the buckle durable in any use.

According to the invention, there is provided a buckle having the following features: a socket body made of a resilient material and having a base end portion to which one end of a belt is to be attached; and a plug body made of a resilient material and having a base end portion to which an opposed end of the belt is to be attached; wherein the socket body includes upper and lower plates connected with one another at one end, the upper plate having an opening, the lower plate having an annular edge portion and a tongue-shape locking projection which extends from said annular edge portion at a side remote of said base end portion of said socket body and which terminates in an engaging edge, and that said plug body includes an insertion member having a resilient tongue-shape operating plate which extends from said base end portion and terminates in an annular marginal portion having on its under side an engaging ledge to be locked with said engaging edge when said plug body is inserted into said socket body, the edge portion of the lower plate is annular, and the engaging edge of the socket body is defined by a forward essentially flat, semicircular part of the

locking projection which is slightly bent upwardly, characterised in that, the opening of the upper plate is a central circular through-hole and the operating plate of the plug body terminates on its forward end in a downwardly directed touching ledge adapted to slightly contact the forward flat part of the locking projection when the plug body is inserted into the socket body, and said engaging ledge is defined by a recess formed in the under surface of said annular marginal portion.

In use, the insertion member of the plug body is inserted into the hollow between the upper and lower plates of the socket body until the engaging ledge defined by the recess formed in the under surface of the annular marginal portion of the insertion member comes into locking engagement with the engaging edge defined by the forward part of the locking projection of the lower plate. The inserting operation has thus been completed. To remove the plug body from the socket body, the operating plate is depressed by the finger through the through-hole to bring the touching ledge of the operation plate to push the locking projection downwardly until the engaging ledge is disengaged from the engaging edge to remove the plug body from the socket body. The removing operation has thus been completed.

#### BRIEF DESCRIPTION OF THE DRAWINGS

- FIG. 1 is a front view of a buckle;  
 FIG. 2 is a cross-sectional view taken along line A-A of FIG. 1;  
 FIG. 3 is a longitudinal cross-sectional view of the buckle in a coupled posture;  
 FIG. 4 is a cross-sectional view taken along line B-B of FIG. 2; and  
 FIG. 5 is a rear view of a plug body of the buckle.

#### DETAILED DESCRIPTION

A buckle according to one embodiment of this invention will now be described with reference to the accompanying drawings.

The buckle, as shown in FIGS. 1 through 5, comprises a socket body 1 and a plug body 2, which are formed of a resilient material of plastics and/or metal, each of the socket and plug bodies 1, 2 having at a base end portion a belt attachment 3, 4. The socket body 1 includes upper and lower plates 5, 6 connected at their base end portions to one another by connecting walls 7, 8, which open at their forward side portions. The upper plate 5 has a central circular through-hole 9. The lower plate 6 has an annular edge portion 10 and a C-shape locking projection 12 which extends from the

annular edge portion 10 at a side remote of the base end portion of the socket body 1 and which terminates in an engaging edge 11. The locking projection 12 should by no means be limited to a C shape and may be a fan shape or any other tongue shape, with the pivotal part being connected with the annular edge portion 10. A forward semicircular part of the locking projection 12 is bent inwardly, i.e., toward the upper plate 5.

The plug body 2 includes at one side an insertion member 13 to be inserted between the upper and lower plates 5, 6 of the socket body 1. The insertion member 13 has in it a resiliently bendable tongue-shape operating plate 15 extending from a base end portion 14 and terminating in a downwardly directed touching ledge 16. The insertion member 13 has an engaging edge 18 defined by a recess formed in the under surface of an annular marginal portion 17 in such a manner that the forward upper surface of the operating plate 15 is substantially flush with the upper surface of the annular marginal portion 17. The touching ledge 16 projects from the operating plate 15 to such an extent that the under surface of the touching ledge 16 comes into slight contact with the locking projection 12 when the insertion member 13 is inserted between the upper and lower plates 5, 6 of the socket body 1, at which time the engaging edge 11 of the locking projection 12 comes into locking engagement with the engaging ledge 18 of the insertion member 13.

Having the foregoing construction, the buckle of this invention gives the following results.

Since the coupling between the socket and plug bodies is accomplished simply by bringing the engaging edge of the locking projection of the lower plate of the socket body into locking engagement with the engaging ledge of the insertion member of the plug body, the coupling operation is simple at all. Further, for releasing this coupling, when the operating plate is simply depressed by the operator's finger through the through-hole of the socket body, the touching ledge of the operating plate pushes the engaging edge of the locking projection until the engaging edge is removed from the engaging ledge of the insertion member 13, thus releasing the plug body from the socket body reliably.

More particularly, since the coupling of the engaging edge of the locking projection and the engaging ledge of the insertion member is done deeply at the side toward the base end portion of the socket body, the coupled parts deep in the socket body would hardly be deformed even if an external force is exerted on the socket body so as to make the insertion opening wider. Therefore, the coupling of the socket and plug bodies is prevented from being accidentally released, and so

this buckle is suitable for use in any fastener.

#### Claims

1. A buckle comprising: a socket body (1) made of a resilient material and having a base end portion to which one end of a belt is to be attached; and a plug body (2) made of a resilient material and having a base end portion to which an opposed end of the belt is to be attached; wherein the socket body (1) includes upper and lower plates (5, 6) connected with one another at one end, the upper plate (5) having an opening (9), the lower plate (6) having an annular edge portion (10) and a tongue-shape locking projection (12) which extends from said annular edge portion (10) at a side remote of said base end portion of said socket body (1) and which terminates in an engaging edge (11), and that said plug body (2) includes an insertion member (13) having a resilient tongue-shape operating plate (15) which extends from said base end portion (14) and terminates in an annular marginal portion (17) having on its under side an engaging ledge (18) to be locked with said engaging edge (11) when said plug body (2) is inserted into said socket body (1), the edge portion (10) of the lower plate (6) is annular, and the engaging edge (11) of the socket body (1) is defined by a forward essentially flat, semicircular part of the locking projection (12) which is slightly bent upwardly,  
**CHARACTERIZED IN THAT**  
 the opening (9) of the upper plate (5) is a central circular through-hole and the operating plate (15) of the plug body (2) terminates on its forward end in a downwardly directed touching ledge (16) adapted to slightly contact the forward flat part of the locking projection (12) when the plug body (2) is inserted into the socket body (1), and said engaging ledge (18) is defined by a recess formed in the under surface of said annular marginal portion (17).

#### Patentansprüche

1. Schnalle, umfassend: einen Muffenkörper (1), der aus einem elastischen Material hergestellt ist und der einen Basisendbereich aufweist, an dem ein Ende eines Riemens befestigt wird; und einen Steckerkörper (2), der aus einem elastischen Material hergestellt ist und der einen Basisendbereich aufweist, an dem ein gegenüberliegendes Ende des Riemens befestigt wird; wobei der Muffenkörper (1) obere und untere Platten (5, 6) aufweist, die an einem Ende miteinander verbunden sind, wobei die

obere Platte (5) eine Öffnung (9) hat, wobei die untere Platte (6) einen ringförmigen Randbereich (10) und einen zungenförmigen Verriegelungsvorsprung (12) hat, der an einer von dem Basisendbereich des Muffenkörpers (1) abgekehrten Seite von dem ringförmigen Randbereich (10) ausgeht und in einem Eingriffsrand (11) endet, und wobei der Steckerkörper (2) ein Einsetzteil (13) aufweist, das eine federnde, zungenförmige Betätigungsplatte (15) hat, die von dem Basisendbereich (14) ausgeht und in einem ringförmigen Randbereich (17) endet, der an seiner Unterseite eine Eingriffsleiste (18) hat, die mit dem Eingriffsrand (11) verriegelt wird, wenn der Steckerkörper (2) in den Muffenkörper (1) eingesetzt wird, wobei der Randbereich (10) der unteren Platte (6) ringförmig ist und wobei der Eingriffsrand (11) des Muffenkörpers (1) von einem vorderen, im wesentlichen ebenen, halbkreisförmigen Teil des Verriegelungsvorsprungs (12) gebildet wird, der leicht nach oben gebogen ist, dadurch gekennzeichnet, daß die Öffnung (9) der oberen Platte (5) eine mittige, kreisrunde durchgehende Öffnung ist und daß die Betätigungsplatte (15) des Steckerkörpers (2) an ihrem vorderen Ende in einer nach unten gerichteten Berührungsleiste (16) endet, die den vorderen ebenen Teil des Verriegelungsvorsprungs (12) leicht berühren kann, wenn der Steckerkörper (2) in den Muffenkörper (1) eingesetzt wird, und daß die Eingriffsleiste (18) von einer in der Unterseite des ringförmigen Randbereichs (17) ausgebildeten Aussparung bestimmt ist.

#### Revendications

1. Boucle comprenant: un corps femelle (1) formé d'une matière élastique et comportant une partie d'extrémité de base à laquelle une des extrémités d'une sangle doit être fixée; et un corps mâle (2) formé d'une matière élastique et comportant une partie d'extrémité de base à laquelle une extrémité opposée de la sangle doit être fixée; le corps femelle (1) comprenant des plaques supérieure et inférieure (5, 6) raccordées l'une à l'autre, à une de leurs extrémités, la plaque supérieure (5) comportant une ouverture (9), la plaque inférieure (6) comportant une partie de bord annulaire (10) et une saillie de blocage (12) analogue à une languette qui s'étend depuis ladite partie de bord annulaire (10), sur un côté situé à l'opposé de ladite partie d'extrémité de base dudit corps femelle (1), et qui se termine par un bord d'accrochage (11), et ledit corps mâle (2) comprenant un élément d'insertion (13) comportant une plaque d'actionnement élastique (15) en

forme de languette qui s'étend depuis ladite partie d'extrémité de base (14) et se termine par une partie marginale annulaire (17) comportant sur son côté de dessous un rebord d'accrochage (18) destiné à être bloqué avec ledit bord d'accrochage (11) quand on insère ledit corps mâle (2) dans ledit corps femelle (1), la partie de bord (10) de la plaque inférieure (6) étant annulaire, et le bord d'accrochage (11) du corps femelle (1) étant défini par une partie avant semicirculaire et essentiellement plate de la saillie de blocage (12) qui est légèrement courbée vers le haut, caractérisée en ce que l'ouverture (9) de la plaque supérieure (5) est un trou traversant central et la plaque d'actionnement (15) du corps mâle (2) se termine à son extrémité avant par un rebord de contact (16) dirigé vers le bas et adapté pour venir légèrement en contact avec la partie plate avant de la saillie de blocage (12) quand on insère le corps mâle (2) dans le corps femelle (1), et ledit rebord d'accrochage (18) est défini par un évidement formé dans la surface inférieure de ladite partie marginale annulaire (17).

5

10

15

20

25

30

35

40

45

50

55

5

FIG. 1

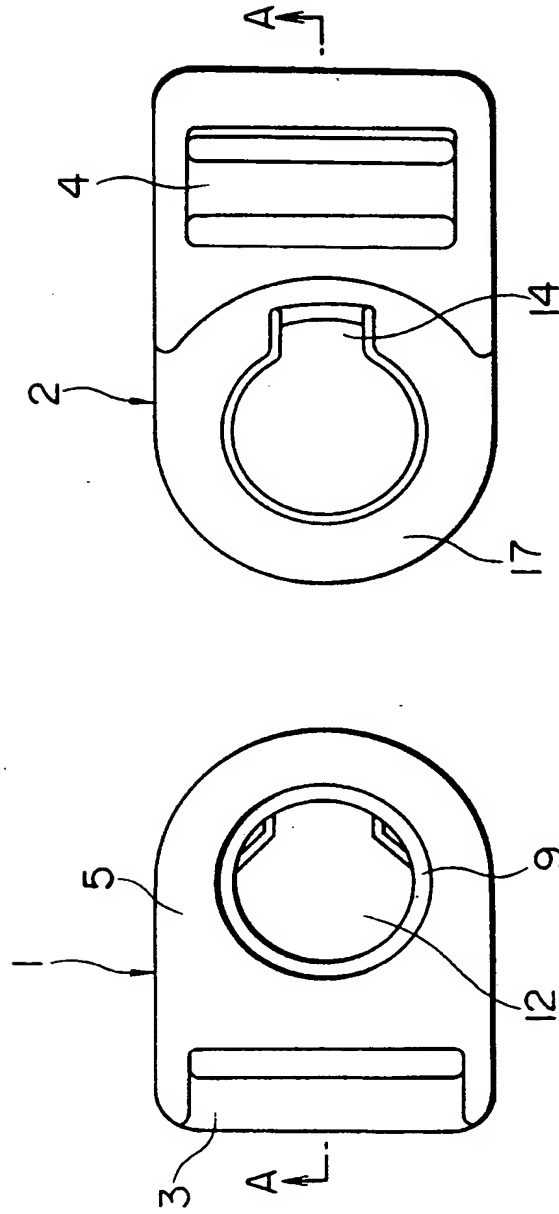


FIG. 2

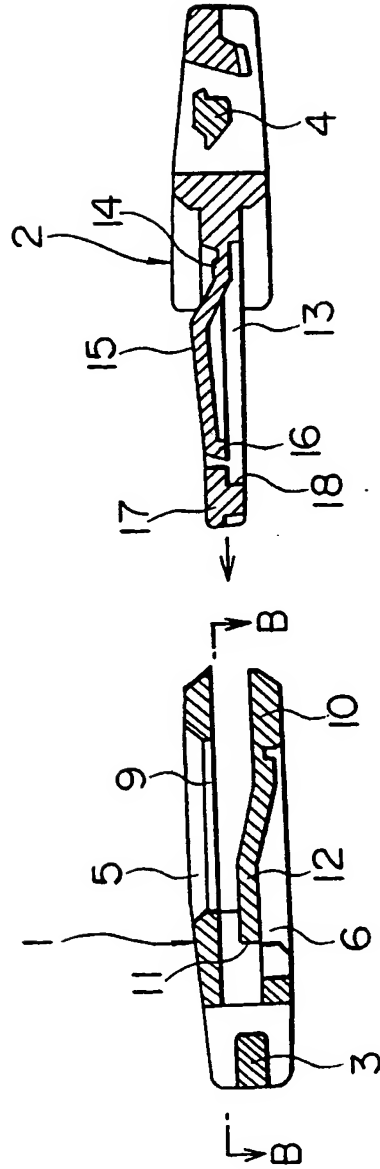




FIG. 3

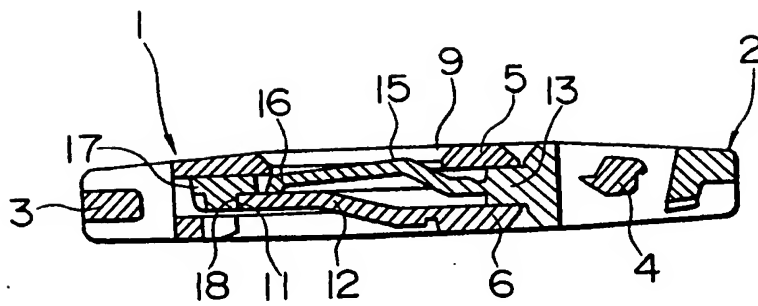


FIG. 4

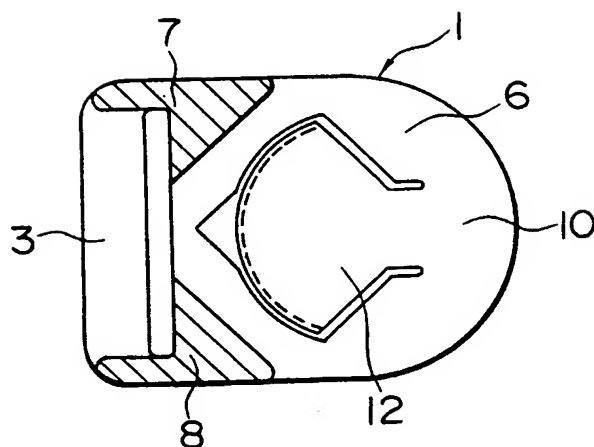
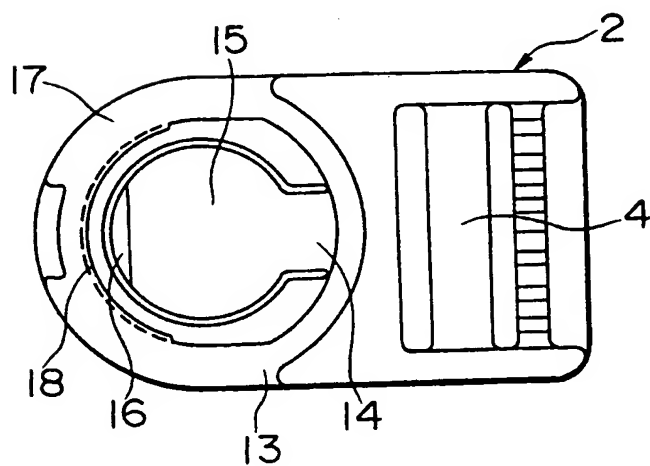


FIG. 5



**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☒ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**